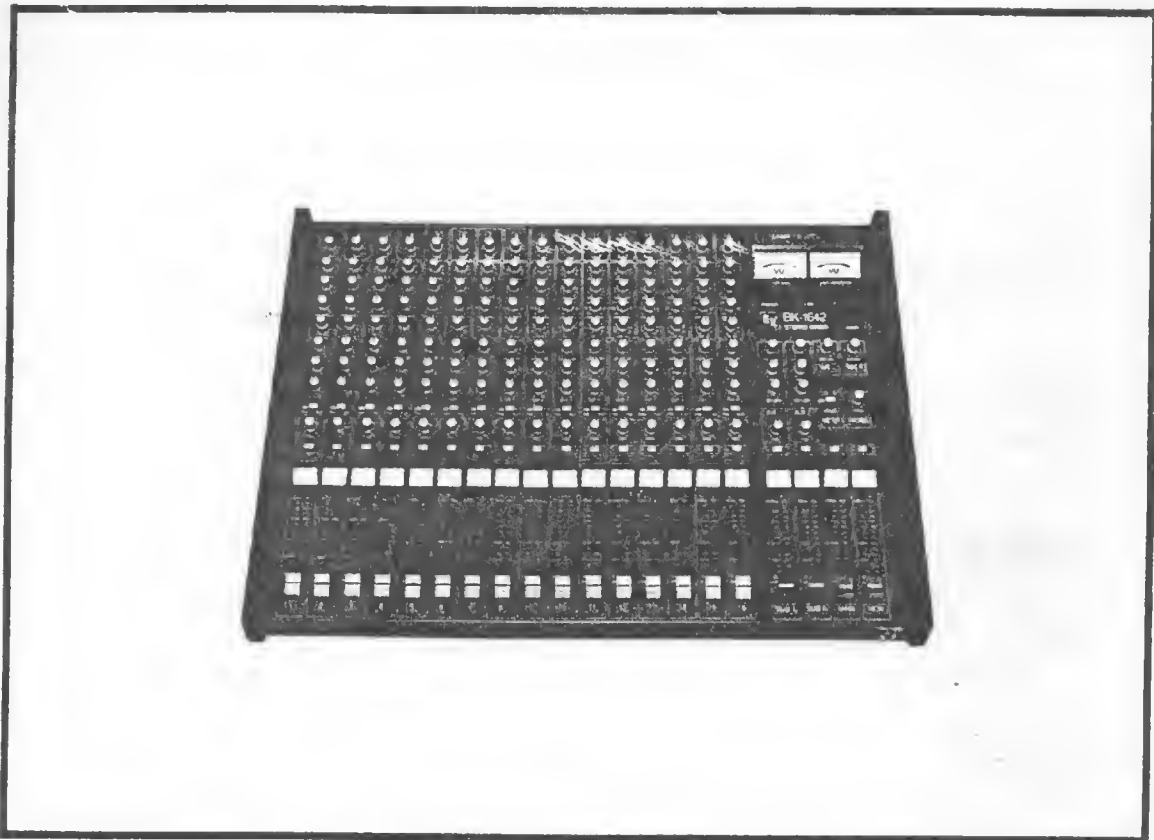




Electro-Voice®

BK-42 SERIES STEREO MIXER

## OWNER'S MANUAL



BK-42 SERIES STEREO MIXER

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SECTION 1.0

GENERAL SPECIFICATIONS

**FREQUENCY RESPONSE —**

Mic Input to Any Output, EQ Flat, All Faders Nominal  
20-20,000 Hz  $\pm 1$  dB

**TOTAL HARMONIC DISTORTION —**

<0.05% at +4 dBu, 20-20,000 Hz  
<0.10% at +24 dBu, 20-20,000 Hz

**HUM AND NOISE —**

Measured with a DIN audio filter (22-22 kHz)

–128 dBu EIN-equivalent input noise, mic input  
terminated 150  $\Omega$ .

Mixer signal-to-noise ratio measured with masters at nominal and all  
inputs off: 79 dB

**CROSSTALK —**

–65 dB typical at 1 kHz adjacent inputs to outputs  
–40 dB minimum, all combinations 20-20,000 Hz

**MAXIMUM VOLTAGE GAIN  $\pm 3$  dB —**

86 dB — Mic In to Main Out  
75 dB — Mic In to Sub, and Monitor Out  
60 dB — Line In to Main Out  
50 dB — Line In to Sub, and Monitor Out

**MICROPHONE INPUTS —**

Low impedance, balanced — pin 2 reference positive

Maximum input level: +6 dBu (1.5 V)

Input impedance at 1 kHz: 4400  $\Omega$

Common Mode Rejection Ratio,

Typical: –75 dB

Minimum, 20-20,000 Hz: –55 dB

**LINE INPUTS —**

High impedance, balanced tip positive

Maximum input level: +24 dBu (12 V)

Input impedance: 60 k $\Omega$

**INPUT CHANNEL EQUALIZATION —**

$\pm 15$  dB shelving at 100 Hz

$\pm 15$  dB peak/dip sweeping from 350-5,000 Hz

$\pm 15$  dB shelving at 10 kHz

**PEAK INDICATOR THRESHOLD —**

+16 dB on input channel (4 dB before clipping)

+14 dBu on VU meter (10 dB before clipping)

**VU METER CALIBRATION —**

0 VU = +4 dBu (1.228 V)

**HEADPHONE OUTPUT —**

Output 20 mW into 8 $\Omega$

Frequency response: 50-15,000 Hz at  $\pm 2$  dB

**LAMP CONNECTOR —**

12 V ac 375 mA maximum

**PHANTOM POWER —**

48 V dc at pin 2 and 3 on mic connector, 6.8 k $\Omega$  source impedance

**POWER REQUIREMENTS —**

100, 120, 220 or 240 V ac 50/60 Hz, 40 watts (120 V ac)

**PFL (pre-fader listen) —**

Switchable for input and output channels

**AUX 2 SEND (input channels) —**

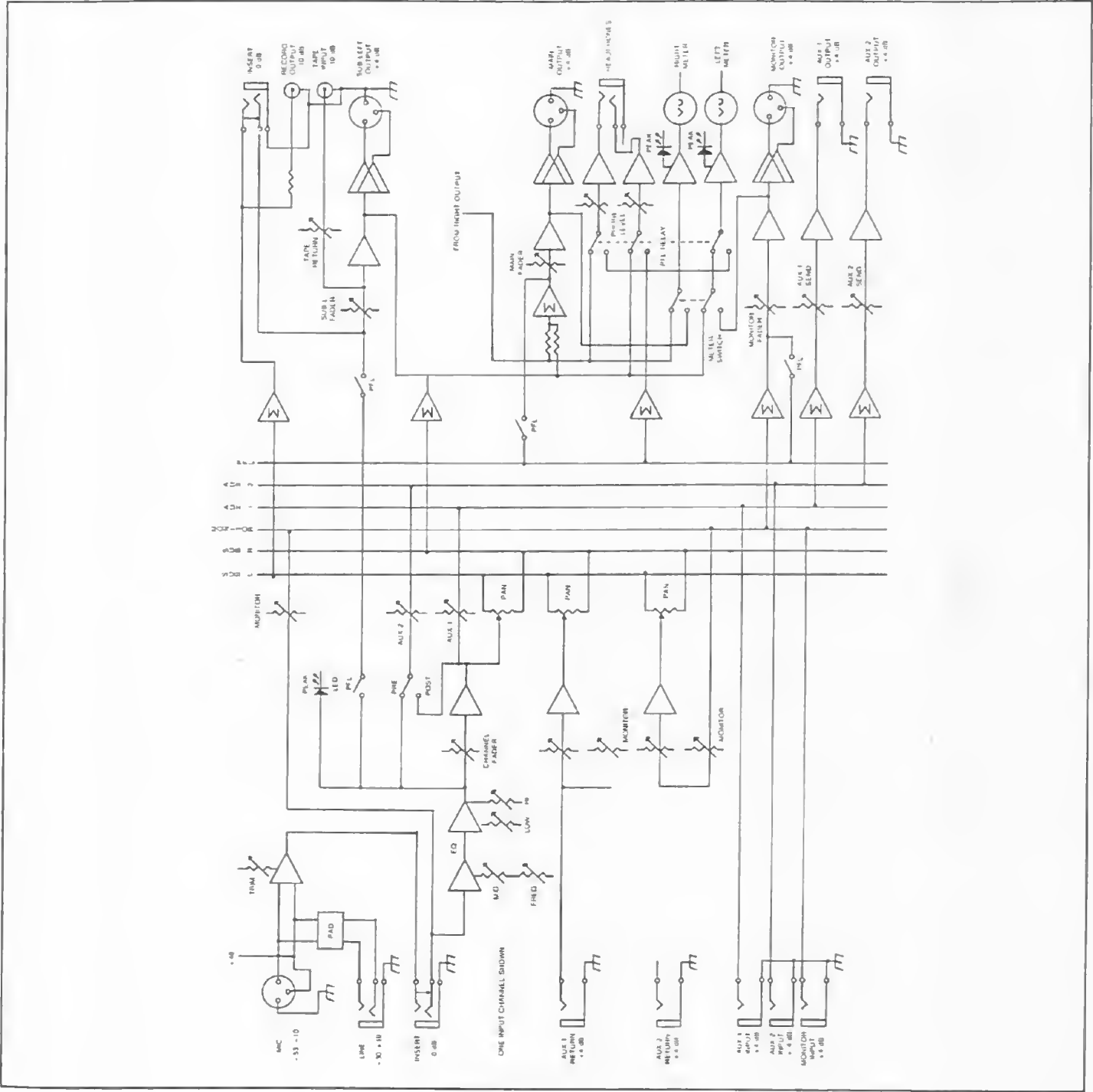
Switchable pre- or post-fader

LINE LEVEL INPUTS

OUTPUTS

	MAXIMUM LEVEL	INPUT IMPEDANCE		MAXIMUM LEVEL	MINIMUM LOAD	INTERNAL IMPEDANCE
Left & Right Insert	+20 dBu	10 k $\Omega$	Main (balanced)	+24 dBu	600 $\Omega$	75 $\Omega$
Left & Right Tape Return	—	5 k $\Omega$	Monitor (balanced)	+24 dBu	600 $\Omega$	75 $\Omega$
Aux Input 1 & 2	+20 dBu	51 k $\Omega$	Left Sub (balanced)	+24 dBu	600 $\Omega$	75 $\Omega$
Monitor Input	+20 dBu	75 k $\Omega$	Right Sub (balanced)	+24 dBu	600 $\Omega$	75 $\Omega$
Input Channel Insert	+20 dBu	5 k $\Omega$	Left & Right Insert	+20 dBu	2000 $\Omega$	100 $\Omega$
			Aux 1 & 2 Out	+20 dBu	600 $\Omega$	100 $\Omega$
			Input Channel Insert	+20 dBu	2000 $\Omega$	100 $\Omega$

SECTION 2.0



SIGNAL FLOW DIAGRAM

42

## SECTION 3.0

## 3.0 INPUT CHANNEL CONTROLS (Figure 1)

The input channel is the beginning of the signal amplification chain of the mixer. Each input channel will accept one signal source which may be equalized, have effects added and sent to the monitor and main system for the audience to hear. Each input has a low-impedance microphone input (the 3-pin XLR connector) and a high-impedance mic or line input (1/4-inch phone jack). The line input will accept signals from an instrument, high-impedance microphone, tape/CD player, keyboard or electronic drums or almost any other audio source. Always make sure that the channel fader (see illustration) or master faders are down before plugging or unplugging input sources.

## 3A. TRIM CONTROL

The TRIM control adjusts the gain of the input amplifier. This is necessary to accommodate the wide variation in signal strength presented to the mixer by the endless variety of signal sources — vocal mics, instruments, CD players, etc. The TRIM control allows you to optimize the amplification for each individual input source. Correct setting of the TRIM control results in the best signal-to-noise ratio (. . . no hiss) and the greatest dynamic range and freedom from overload distortion.

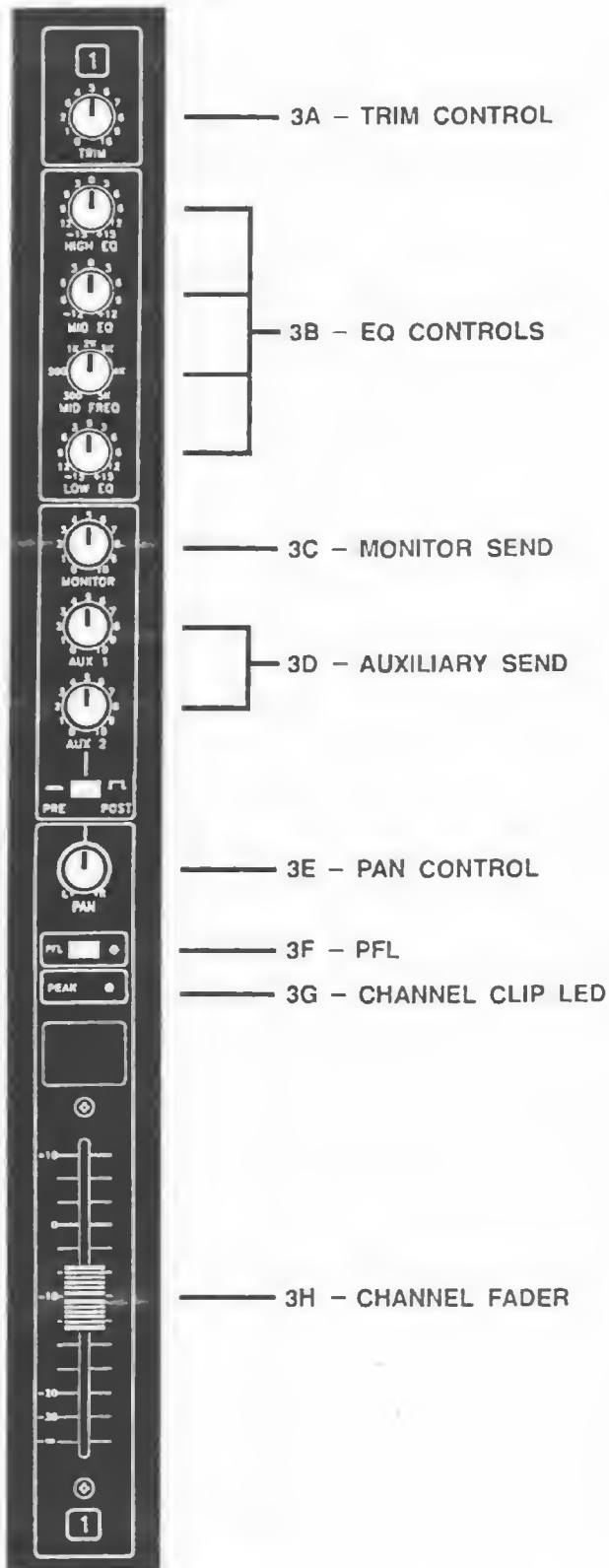
TO GET THE CLEANEST, QUIETEST OPERATION FROM THE BOARD, IT IS IMPORTANT THAT THE TRIM CONTROL BE PROPERLY SET. To set up a mix, first set all TRIM controls at "0" (minimum). Start at the output stage of the mixer and work back towards the input. Set the subgroup controls and the channel faders at "0" (nominal level). Set the EQ. Use as little gain from the TRIM control as possible to achieve balance.

To achieve the lowest noise and widest dynamic range, you want to run the output section hard and use little or no TRIM adjustment. Work with the output section of the mixer and the level controls on your amplifier to achieve the necessary playback level.

## 3B. EQ CONTROLS

Equalization can be more simply described as sophisticated tone control. The EQ circuits used in the BK-42 series have a substantial amount of sound shaping capability.

This wide range can be a bonus when dealing with widely-varying instrument signals, poor acoustics



## 3B. EQ CONTROLS (continued)

or other problems. The EQ should be used sparingly, however, for the best results. Too liberal use of the EQ can cause phasing problems, add noise and use up a lot amplifier power.

3B-1. HIGH EQ 10 kHz SHELIVING TYPE  $\pm 15$  dB

Controls the treble content of the input signal. Turning the control counterclockwise decreases the amount of treble, clockwise increases it.

## 3B-2. MID EQ

Controls the midrange content of the input signal. Turning the control counterclockwise decreases the amount of midrange and turning it clockwise increases it.

3B-3. MID FREQUENCY 300-5 kHz Sweepable  $\pm 15$  dB

Controls the frequency range the MID EQ control works in. By varying the FREQUENCY, different tonal perspectives can be created. The sweepable frequency gives much more control flexibility.

3B-4. LOW EQ 100 Hz Shelving Type  $\pm 15$  dB

Controls the bass content of the input signal. Turning the control counterclockwise decreases the amount of midrange and turning it clockwise increases it.

## 3C. MONITOR SEND

The monitor send control sets the level of that input signal in the monitor mix. It is independent of all input channel controls except the TRIM control. It is not affected by the channel EQ controls or slide fader. Thus, it is independent of, and not affected by, changes in the main or house mix.

## 3D. AUXILIARY SEND

The AUXILIARY 1 send control sets the level of that signal in the AUX 1 mix and is post-fader, which means that it is affected by the gain setting of the fader. The AUX 1 send may also be used as a mono send for recording.

The AUXILIARY 2 send control sets the level of that input signal in the AUX 2 mix and is switchable PRE or POST EQ and fader. In the PRE position it serves as another "MONITOR OUT" and in the POST position, another "EFFECTS OUT."

## 3E. PAN CONTROL

Short for "panoramic potentiometer." This control allows you to place the channel's input signal within the stereo image by assigning more or less of the signal to the left or right submaster controls. Turning the panpot to the left of center moves the apparent source toward the left channel. Turning the panpot to the right of center moves the apparent source toward the right channel. Centering the control makes the apparent source centered between the channels. If all inputs are panned center, the result is mono.

Some users pan all the instruments to one side and the vocals to the other and use the subgroup controls to balance them.

## 3F. PFL

PFL (pre-fader listen) allows the operator to preview any pre-fader signal individually or in combination through the headphone output. To activate the PFL simply depress the appropriate switches. The status indicator will light indicating the pre-fader signals being monitored. When the PFL circuit is engaged, the right channel meter will show the audio level of the selected channel(s).

In the normal position (all PFL switches off) the headphone circuit monitors the output of the SUB L and SUB R outputs. The audio level of the headphone jack is controlled by the PHONES control.

## 3G. CHANNEL CLIP LED

The CHANNEL CLIP LED monitors the input channel circuit for clipping or overload (both before and after the EQ section). If it lights, you are bordering on distortion. You will hear this in the output as a harsh, blaring sound on volume peaks. This might be caused by excessive boost in the channel equalization controls, or a TRIM control setting that is too high for the input signal. Generally, re-adjusting the TRIM control will cure the difficulty.

## 3H. CHANNEL FADER

The slide fader controls the output level of the channel as it is fed to the subgroups. The control should be normally set around the "0" mark (nominal level). At this point, the signal level is high enough to keep noise from creeping in and low enough to insure plenty of headroom and freedom from clipping distortion. If the fader must run wide open to get enough level, turn up the TRIM control (judiciously) or increase the level setting of the left and right submaster controls. Conversely, if the fader must be pulled way back to get the right level, the TRIM control or stereo submasters should be adjusted. Adjust the TRIM control if the CLIP LED lights, otherwise adjust the stereo submasters. For optimum performance, the channel FADERS should be run close to the "0" mark.

## SECTION 4.0

## 4.0 OUTPUT SECTION CONTROLS

## 4A. MONITOR SEND (AUX 1, AUX 2)

The TO MON (to monitor) control sets the level of AUX 1 and/or AUX 2 effects to the monitor system. With the use of this control, the performers can hear the added affects in their monitors.

## 4B. EFFECTS SEND (AUX 1, AUX 2)

The EFFECTS SEND control sets the level of the signal appearing at the effects send output jack(s) going to any type of outboard effects device(s) such as a digital reverb, flanger, compressor/limiter, etc. The source of this signal is via the individual AUX 1 and AUX 2 send level controls on each input channel.

## 4C. EFFECTS RETURN (AUX 1, AUX 2)

The EFFECTS RETURN level control determines the amount of externally generated effects signals in the main mix. This signal is mixed into the left and right stereo sub channels via the Aux 1 and Aux 2 PAN control(s).

## 4D. PAN CONTROL (AUX 1, AUX 2)

The effects PAN control (Aux 1, Aux 2) directs the signal coming from the EFFECTS RETURN level control(s) into the left and/or right sub channels. The control works in an identical way to the input channel PAN control.

## 4E. MASTER SECTION CONTROLS

The master section controls affect the subgroup, main and monitor output levels.

The use of subgroups can be demonstrated by this example: If the input channel(s) PAN controls are set fully clockwise for all the vocals, then we will have assigned the SUB R fader as a "vocal submaster." If we raise or lower the SUB R control we can set the proper vocal level in the mix while preserving the input channel balance set among the vocalists.

## 4E-1. SUB L (Left Submaster)

Controls the volume of the left stereo output channel. It is also used as a subgroup master.

## 4E-2. SUB R (Right Submaster)

Controls the volume of the right stereo output channel. It is also used as a subgroup master.

## 4E-3. MAIN MASTER

The MAIN (monaural) output is an equal mix of the left and right stereo outputs. The MAIN master controls the volume of the output.

## 4E-4. MON (Monitor Master)

Controls the volume of the monitor output signal. The monitor output is a mix of the individual channel monitor sends.

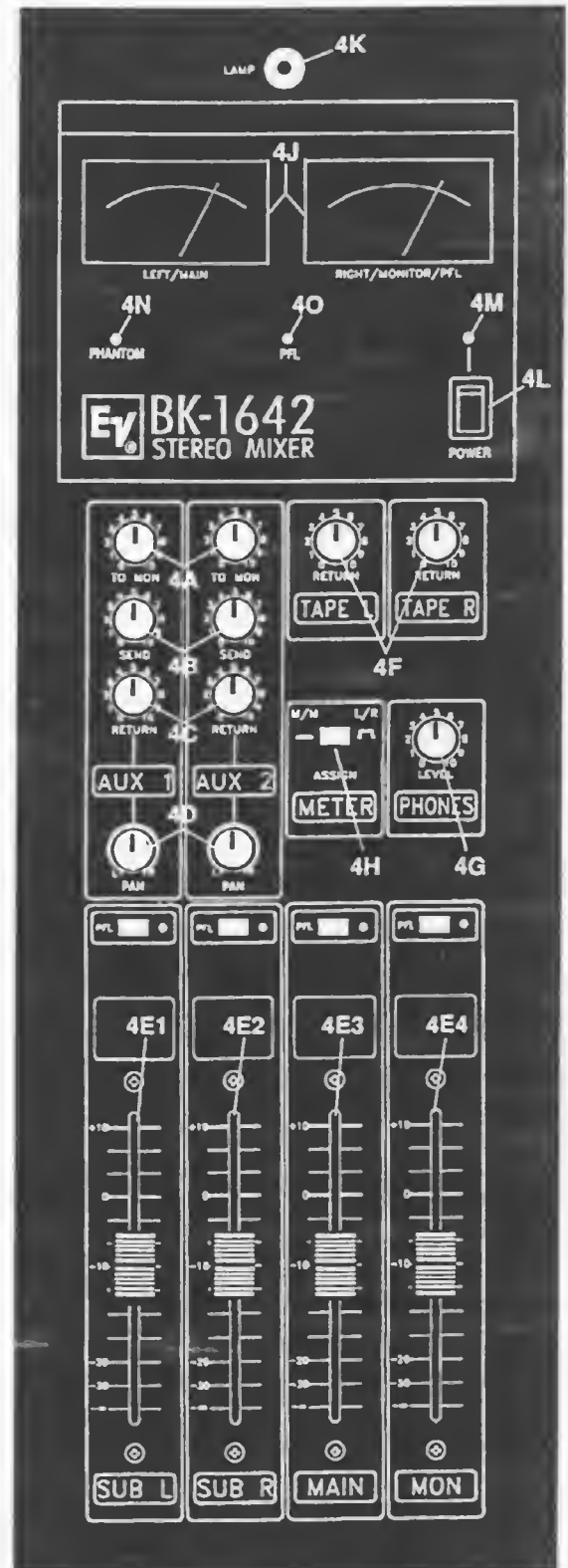


FIGURE 2 — Output Section Controls and Functions

**SECTION 4.0 (continued)****4F. TAPE L AND TAPE R (Tape Left and Right Returns)**

These controls adjust the level of tape left and right inputs.

**4G. PHONES (Headphone Level)**

The PHONE gain control sets the level at the HEADPHONE jack (front panel). Any signal selected by depressing a PFL switch will be monitored through the headphone jack. Without any of the PFL switches depressed, the headphone circuit monitors the left and right subgroup outputs in stereo.

**4H. METER ASSIGNMENT SWITCH**

A push-push switch is provided to allow the user to select the points in the circuit which are monitored by the VU meters. When the switch is depressed, the indication will be the audio level at the Sub Left and Sub Right outputs. In the other (non-depressed) position, signal level at the main and monitor outputs will be shown.

**4J. VU METERS**

Two "B" scale analog VU meters with integral peak lights are used to indicate signal level at selected points in the circuit (see meter assignment switch and PFL switches). The meter scale goes from -20 dBu to +4 dBu, a standard in the industry. The integral peak light, located in the upper right-hand corner of each meter, shows when the output goes above the +14 dBu level and the headroom is being rapidly exhausted and distortion is imminent. The meters read either left/right stereo, main/monitor level or, if any of the PFL switches are depressed, the right meter will monitor the PFL signal. A PFL LED is provided on the meter bridge to acknowledge this condition.

**4K. LAMP CONNECTOR**

A BNC-type socket is provided at the top of the mixer panel to accommodate a Littlelite® gooseneck lamp to allow operation of the board in low-light conditions. These lamps are available in different lengths from many professional sound dealers and attaches without tools. The LAMP CONNECTOR can accommodate either normal or high intensity lamps.

**4L. POWER SWITCH**

The power switch is used to turn on and off the main ac power.

**4M. POWER INDICATOR**

This LED (green) is illuminated when the ac main power is on.

**4N. PHANTOM POWER INDICATOR**

This LED (red) indicates when phantom power is present at the microphone inputs.

**4O. PFL INDICATOR**

This LED (amber) indicates when the PFL circuit is activated and shows that the right meter is reading the PFL level.

**SECTION 5.0****5.0 REAR PANEL INPUT CONNECTORS**

A BK-42 series mixer can accept program material covering a dynamic range of over 100 dB. All of the line inputs can safely accept signals at least up to +20 dBu. (See specifications for details.) All line inputs are made through standard 1/4-inch phone jacks (except for TAPE inputs). Several of the inputs that directly access the mix busses can be used to stack mixers together without using up an input channel. The stacking group includes the AUX 1, AUX 2 and MONITOR inputs. The AUX return inputs may be used as the stacking inputs. For stereo subgroup stacking, set AUX 1 PAN to L, and AUX 2 PAN to R and use AUX 1 and 2 RETURNS for left and right stacking, respectively.

**5A. BALANCED LOW-Z MIC INPUT**

A 3-pin XLR-type connector is used for balanced low-impedance microphones. The MIC INPUT is actively balanced; active balancing allows elimination of the input transformer (along with its limitations), while maintaining the RF and hum rejection of a good transformer-coupled input.

It is important during operation or testing of the mixer that all channel faders remain fully down whenever the mic input is not *properly* terminated with a microphone or equivalent 150-ohm source. An open mic input invites the introduction of high noise levels which could produce lower quality sound or an incorrect test measurement.

**5B. HIGH-Z LINE INPUT**

A standard 1/4-inch phone jack is used for balanced or unbalanced line level signals. Examples of line level signals include most electronic keyboards, drum machines and synthesizers, tape decks, CD players, etc. All input channel controls, including the variable GAIN control, affect the LINE input. Maximum input level before preamp clipping is 12 volts or +24 dB.

If a sufficient signal level is not possible with the GAIN control in its furthest clockwise position, the input signal must then be treated as a mic level signal and connected to the microphone input. If necessary, use an appropriate balancing transformer (EV model 502CP or equivalent) or a direct box with the microphone (XLR) input.



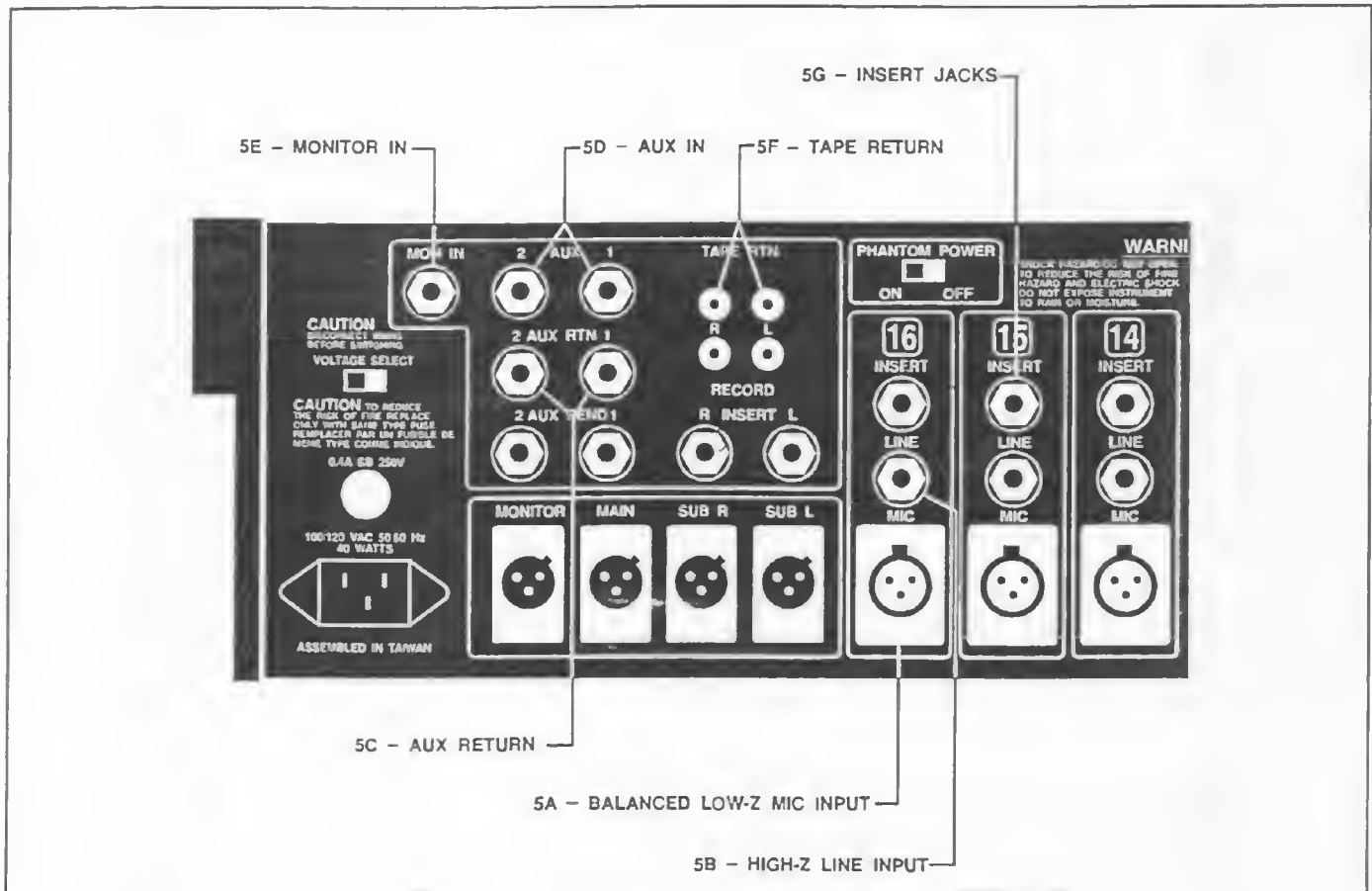


FIGURE 3 — Rear Panel Input Connectors

## SECTION 5.0 (continued)

## 5C. AUX RETURN (RTN) (AUX 1 and AUX 2)

The AUX RETURN jack(s) are used for signals to be fed to the subgroup busses. The signal is controlled by the RETURN and PAN front panel functions.

## 5D. AUX IN (AUX 1 and AUX 2)

The AUX IN jack(s) will put signals directly into the respective AUX bus. Crosstalk and buffering protection are provided by the input circuit and the signal level is controlled by the external source.

## 5E. MONITOR IN

The MONITOR IN jack will put signals directly onto the MONITOR bus. Crosstalk and buffering protection are provided by the input circuit and the signal level is controlled by the external source.

## 5F. TAPE RETURN

There are RCA-jacks on the mixer to allow hooking up a tape deck or CD player. The input goes into the left and right subgroups and its level is controlled by front panel controls. It is also possible to use these as another AUX return.

## 5G. INSERT JACKS (SUB L and SUB R)

A space-saving 3-conductor (stereo) phone plug is used for both output from SUB L and SUB R respectively, and for the return to the mixer's master section from an external processing device. Be sure the device you want to patch in has line level unbalanced inputs and outputs. The signal at the insert jack can drive loads of 2,000 ohms or greater and the external processing device should have a low output internal impedance (100 ohms or less).

A nominal input signal is a level of +4 dBu; the maximum level is +20 dBu.

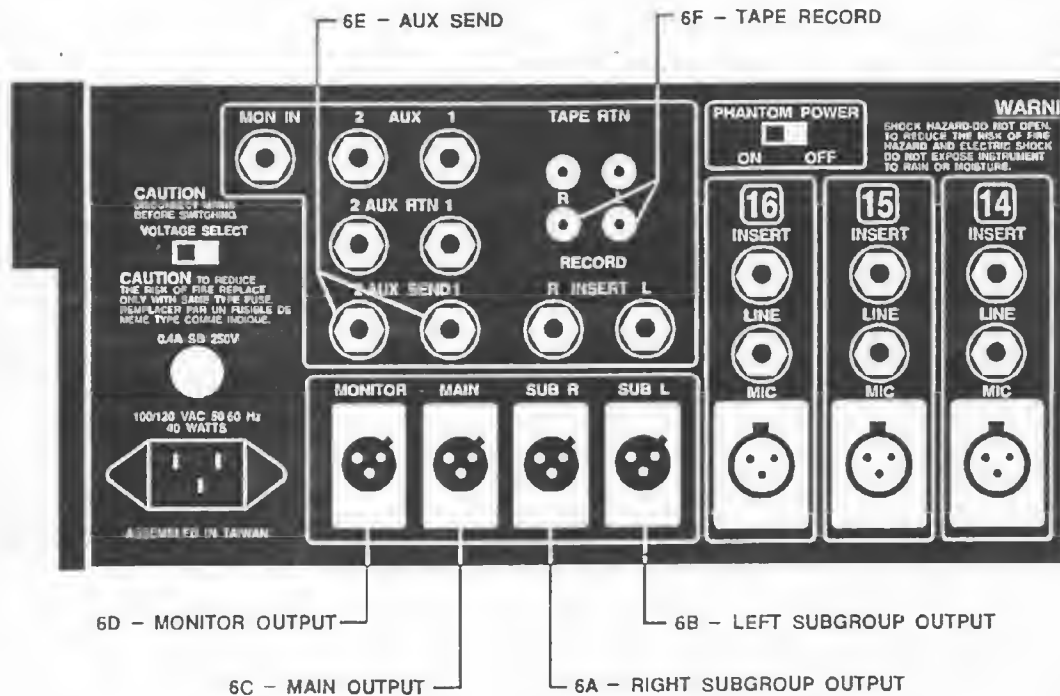


FIGURE 3 — Rear Panel Output Connectors

## SECTION 6.0

## 6.0 REAR PANEL OUTPUT CONNECTIONS

In the BK-42 series mixer, the SUB L, SUB R, MAIN and MONITOR outputs are servo-balanced and made through chassis-mount 3-pin XLR-type connectors to a maximum level of +24 dBu.

All other output connections are line level, unbalanced, and made through standard ¼-inch phone jacks (except for RECORD OUT).

## 6A. SUB R RIGHT SUBGROUP OUTPUT

This output is derived by summing all of the points (channels and external) assigned to the right subgroup buss. A PAN control rotated fully clockwise to the "R" position will assign that signal only to the right buss.

## 6B. SUB L LEFT SUBGROUP OUTPUT

This output is the left subgroup equivalent of the SUB R output.

## 6C. MAIN OUTPUT

The MAIN output is a 50/50 mix of the right and

left subgroup outputs. Since the BK-42 series is a true subgroup mixer, all signals that appear in the main mix must come through the subgroup channels.

## 6D. MONITOR OUTPUT

The MONITOR output signal is the sum of all the input channel monitor sends and the external monitor input signal.

## 6E. AUX SEND (AUX 1 and AUX 2)

The AUX SEND output signal is the sum of all of the input channel AUX sends (PRE or POST EQ and fader) plus any signal coming through the AUX IN input.

## 6F. TAPE RECORD

The TAPE RECORD output signals are the sum of all the input channels and effects with their position in the L + R stereo mix. The TAPE RECORD output is via RCA-jacks fixed at -10 dBu for easy interfacing and compatibility with semi-pro and hi-fi tape decks.

---

**SECTION 7.0****7.0 SWITCHES****7A. PHANTOM POWER**

This switch turns on and off the phantom power supply. The phantom power supply provides power for condenser-type microphones through the microphone cable. When switched on, it provides 48 volts dc (with 3.4 K-ohm source impedance) at pins 2 and 3 on all of the microphone input connectors. Pin 1 (the shield conductor) provides the ground return path. This will power standard condenser microphones. When switched on or off, the voltage will ramp slowly up or down; it takes a few seconds to reach full level. This prevents unwanted transients from reaching the microphone inputs. When the switch is engaged, a red LED will light on the meter bridge to confirm its operation.

**7B. VOLTAGE SELECT**

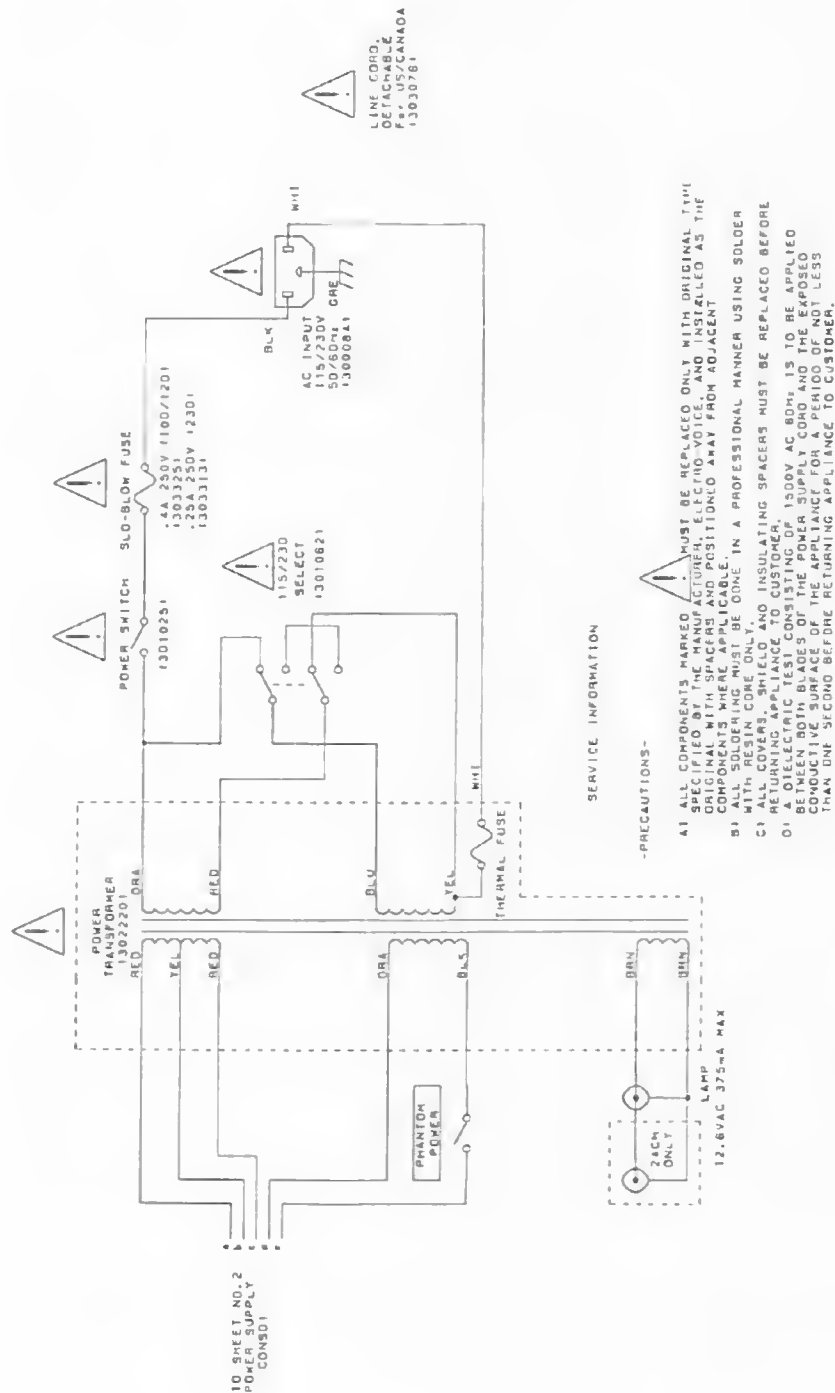
**CAUTION! BEFORE ATTEMPTING TO MOVE THIS SWITCH, THE MIXER MUST BE TURNED OFF AND THE POWER CORD DISCONNECTED!**

The BK-42 series is capable of operation at 115 or 230 V, 50 or 60 Hz. To safely accomplish a voltage change, follow these steps:

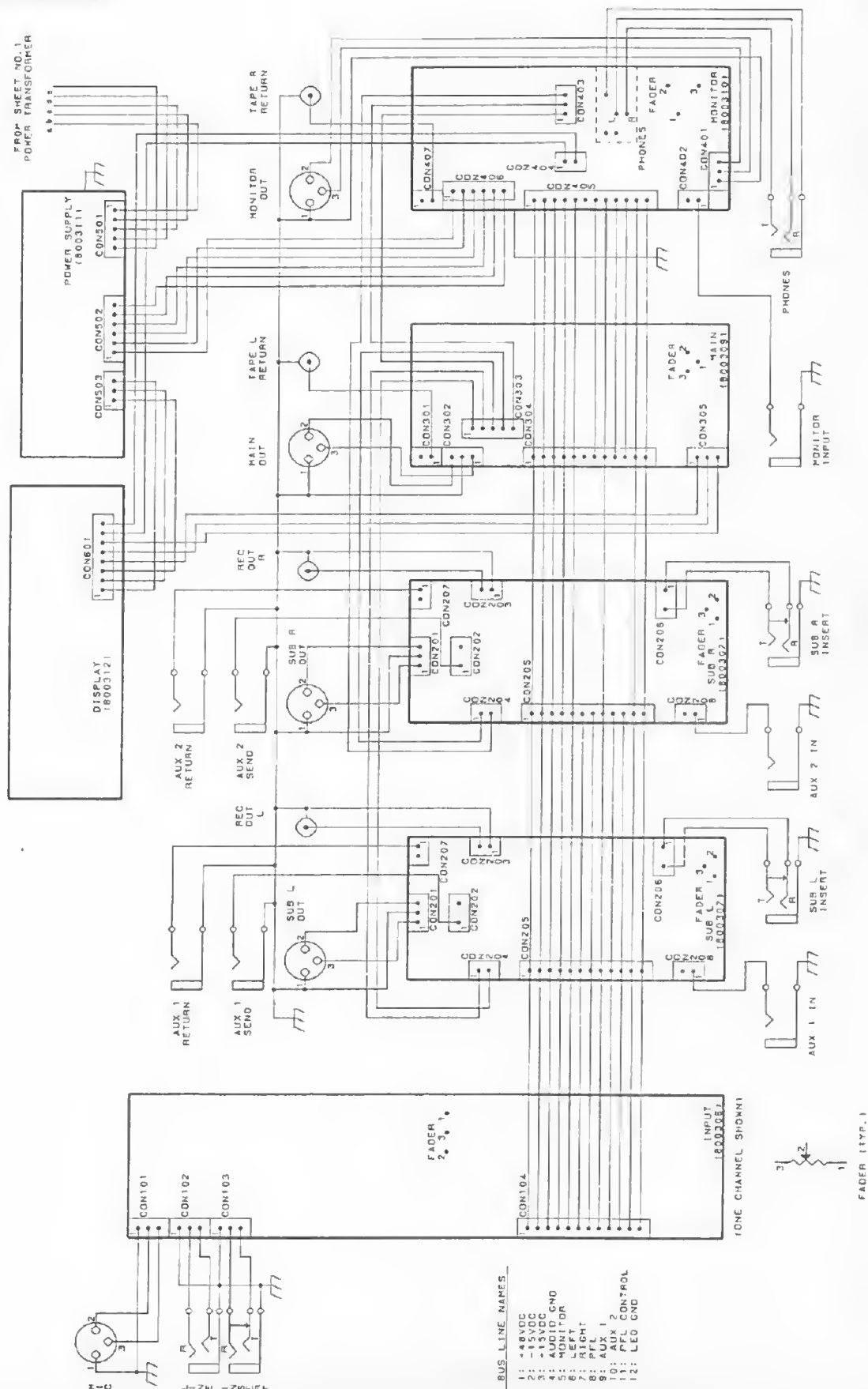
1. As noted above, turn the mixer off and completely disconnect the ac power cord.
2. If the unit is used for 115-V operation, be sure a 0.4 AMP SLO-BLO (5x20 mm) FUSE is installed in the holder. If the unit is used for 230-V operation, be sure a 0.25 AMP SLO-BLO (5x20 mm) FUSE is installed in the holder.
3. Change the chassis-mounted switch on the back of the unit to the correct corresponding voltage.
4. Plug the power cord in and resume normal operation.

SECTION 8.0

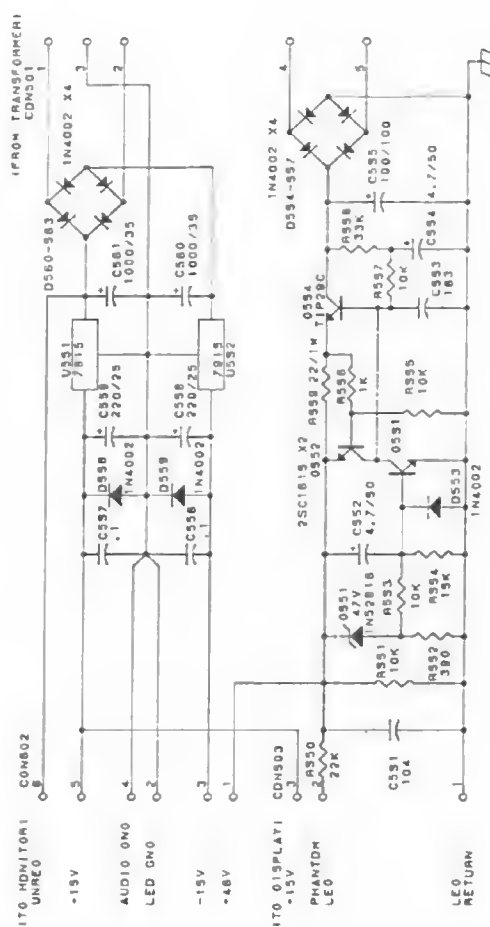
8.0 WIRING DIAGRAM



## 8.0 WIRING DIAGRAM



## 9.0 SCHEMATIC



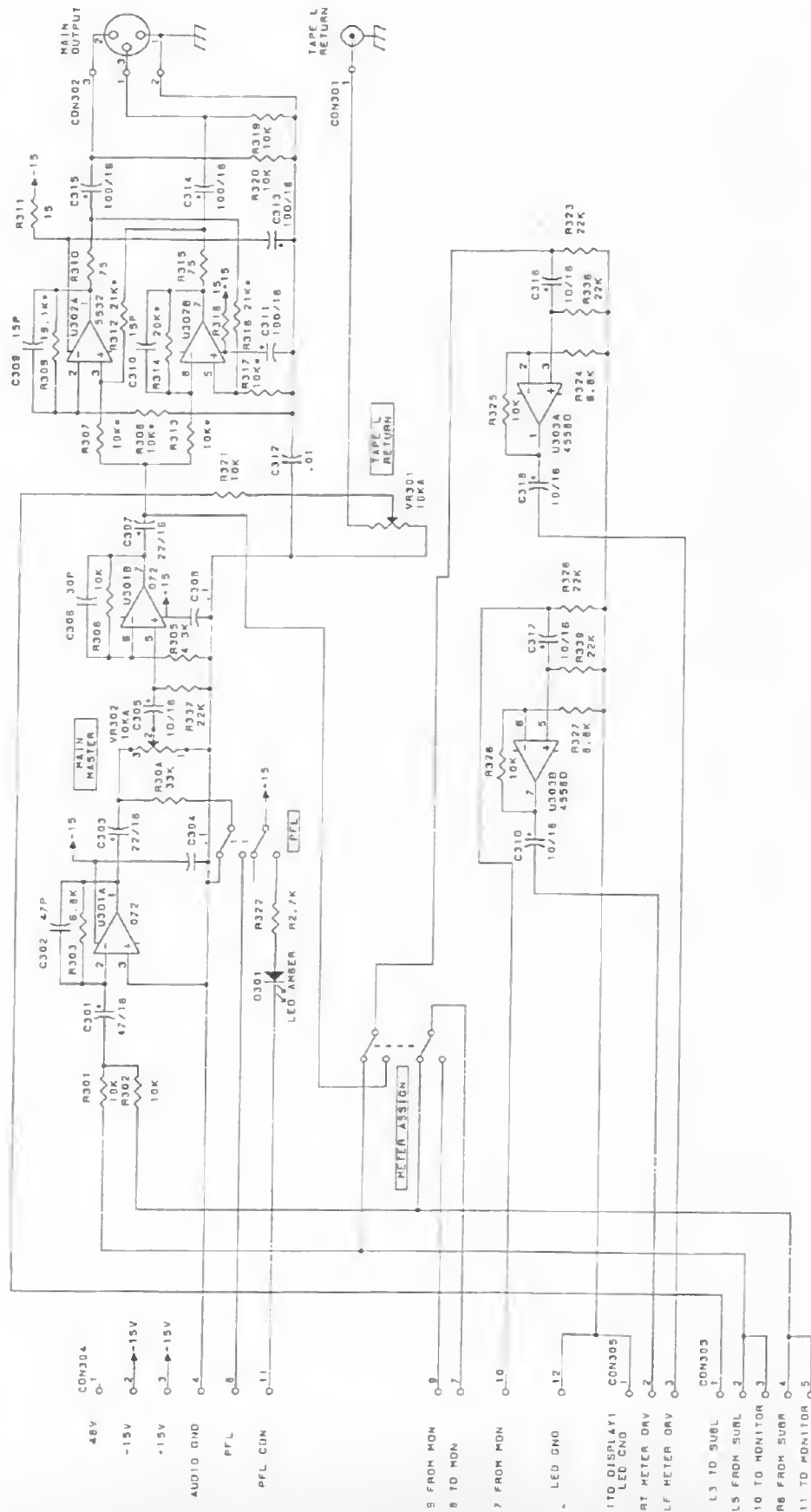
MEMBER SUPPLY BOARD

### SERVICE INFORMATION

1. RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED.
2. CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED.
3. CAPACITOR 103 = 0.01% TYPAR 104 = 0.1% TYPAR 105 = 0.5% TYPAR
4. RESISTORS ARE 5% CARBON FILM 25W UNLESS OTHERWISE SPECIFIED.
5. 10 DENOTES 1% METAL FILM .25WATT

## SECTION 9.0

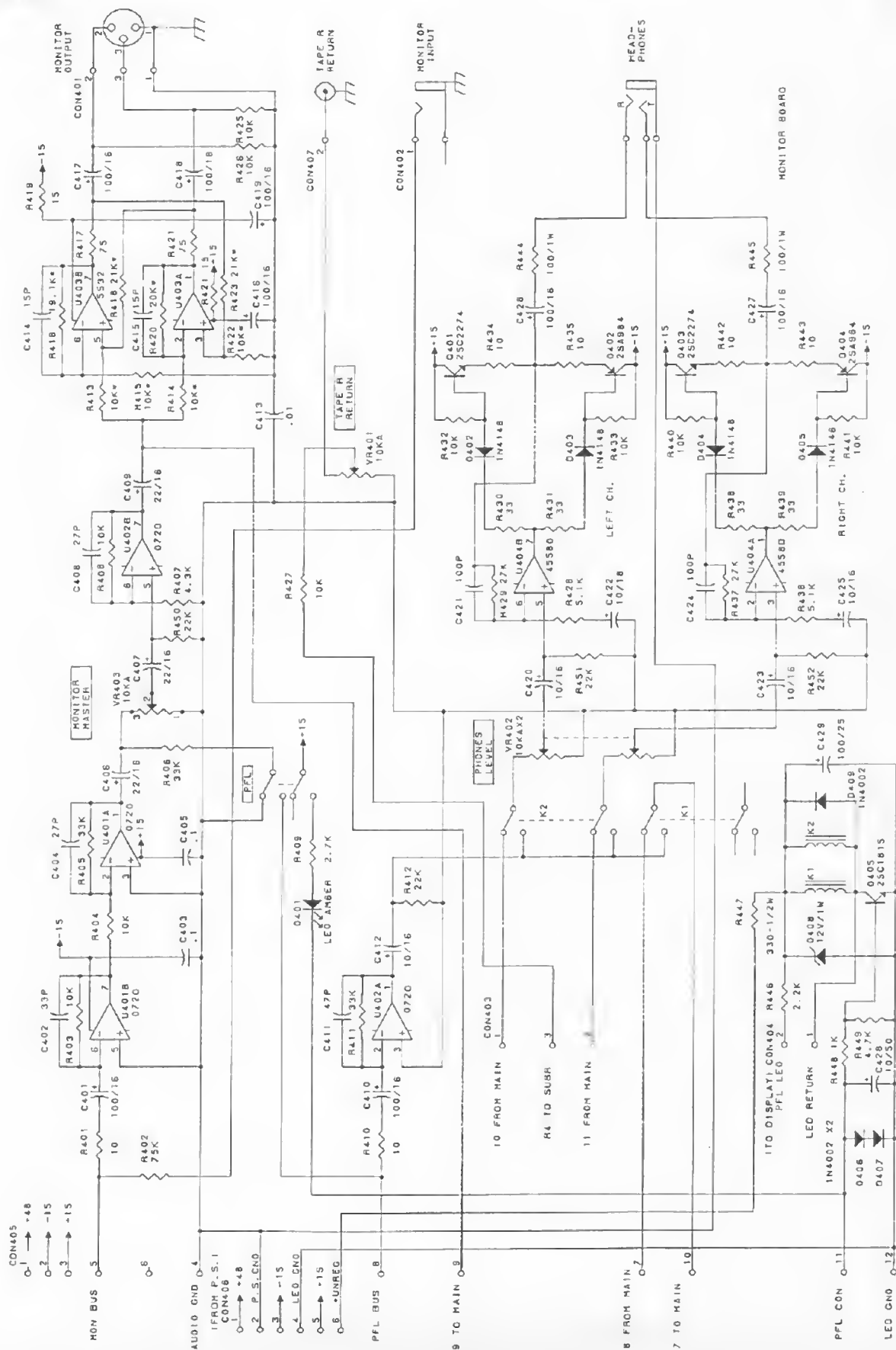
## 9.0 SCHEMATIC



MAIN BOARD

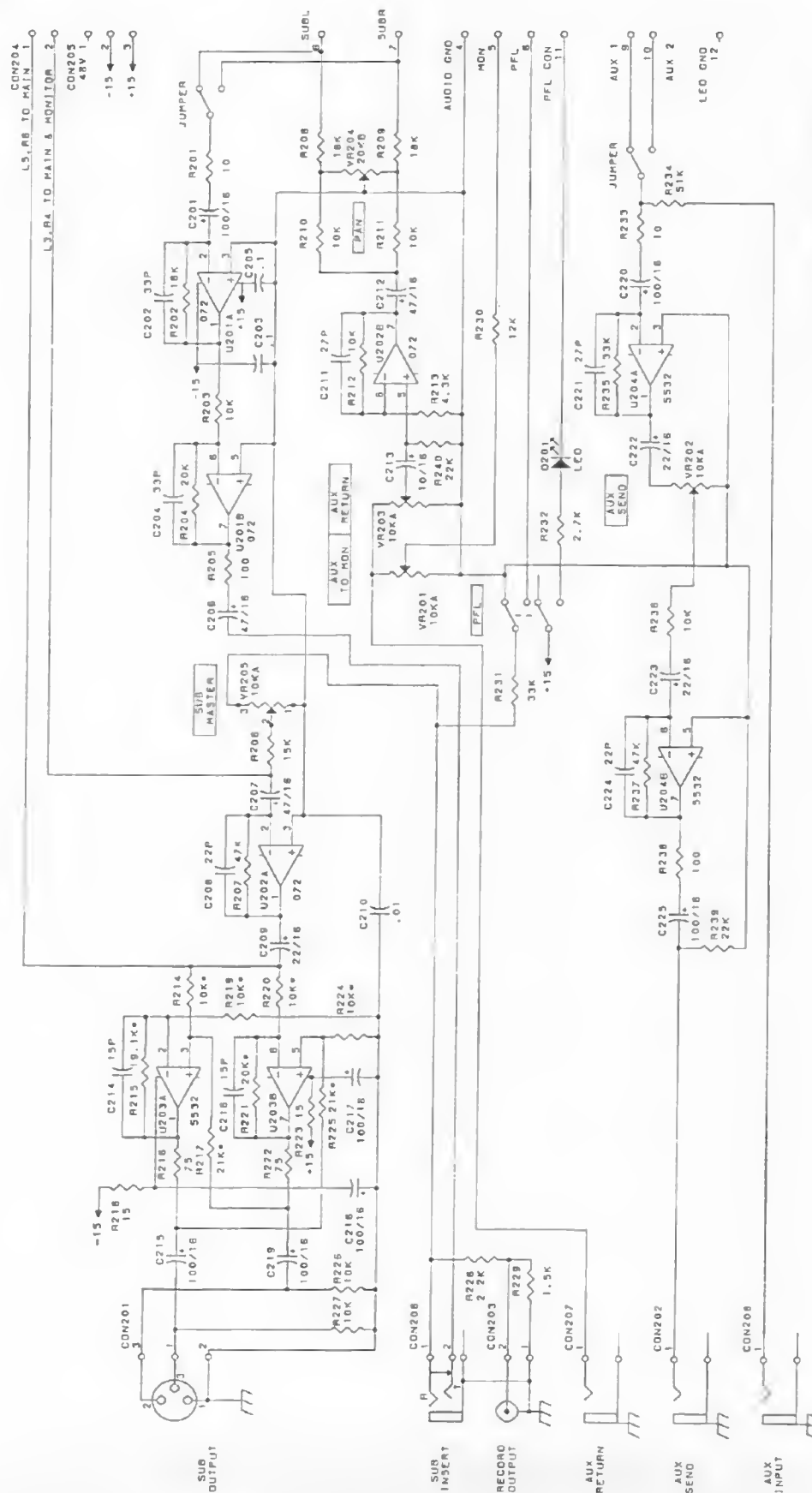
## SECTION 9.0

## 9.0 SCHEMATIC





## 9.0 SCHEMATIC

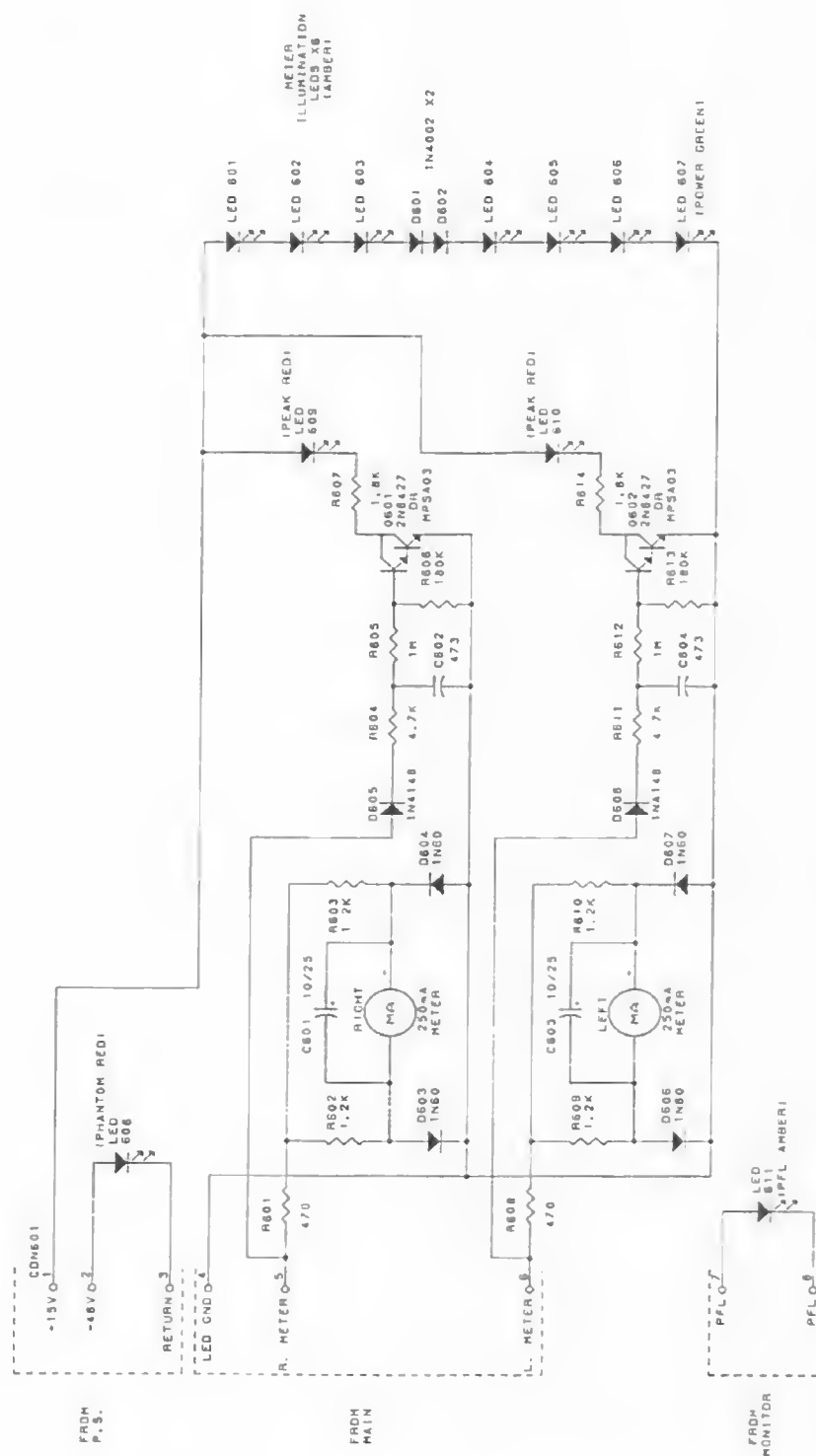


NOTE: JUMPEAS SHOWN SET FOR SUB LEFT

SUP BOARD

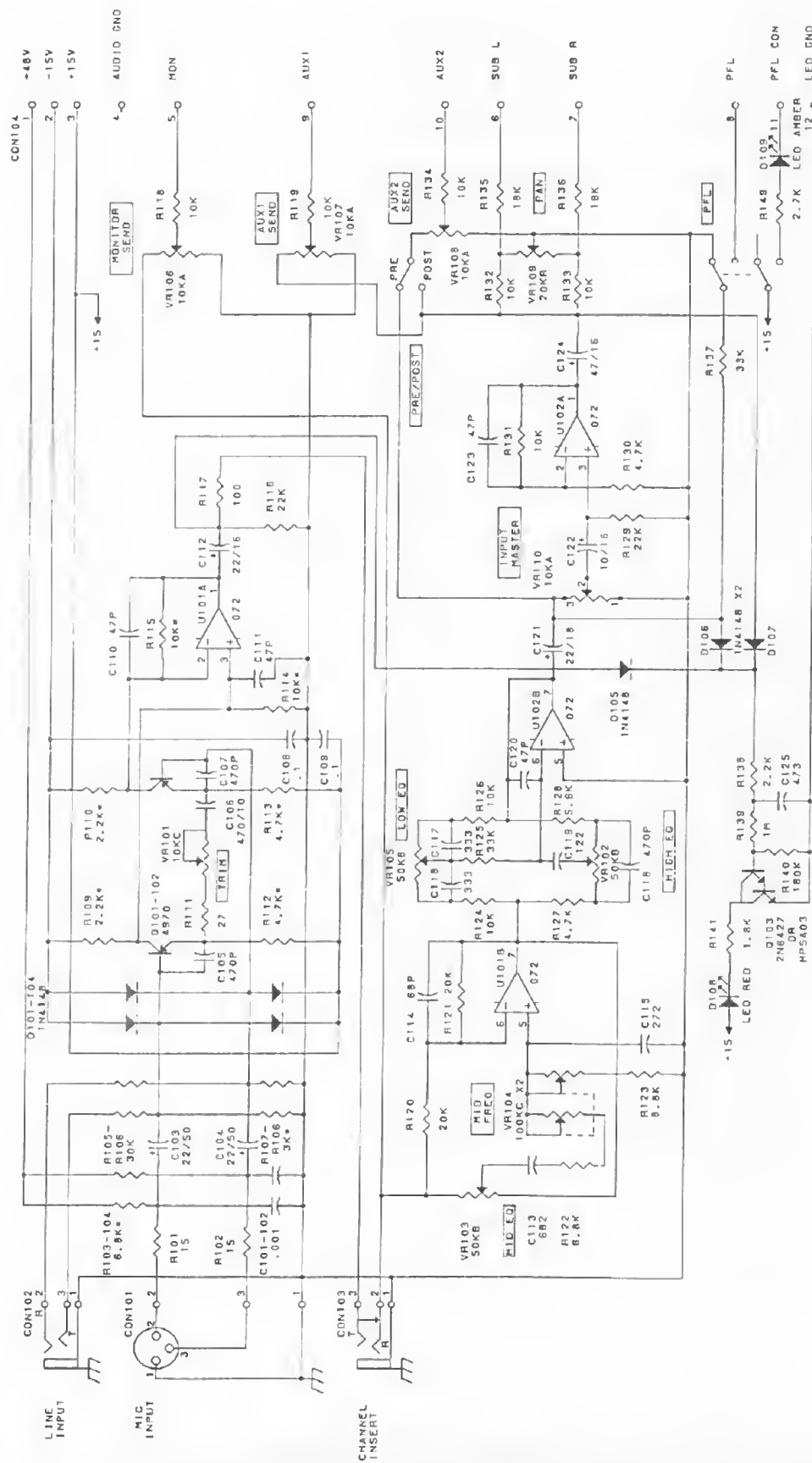
## SECTION 9.0

## 9.0 SCHEMATIC



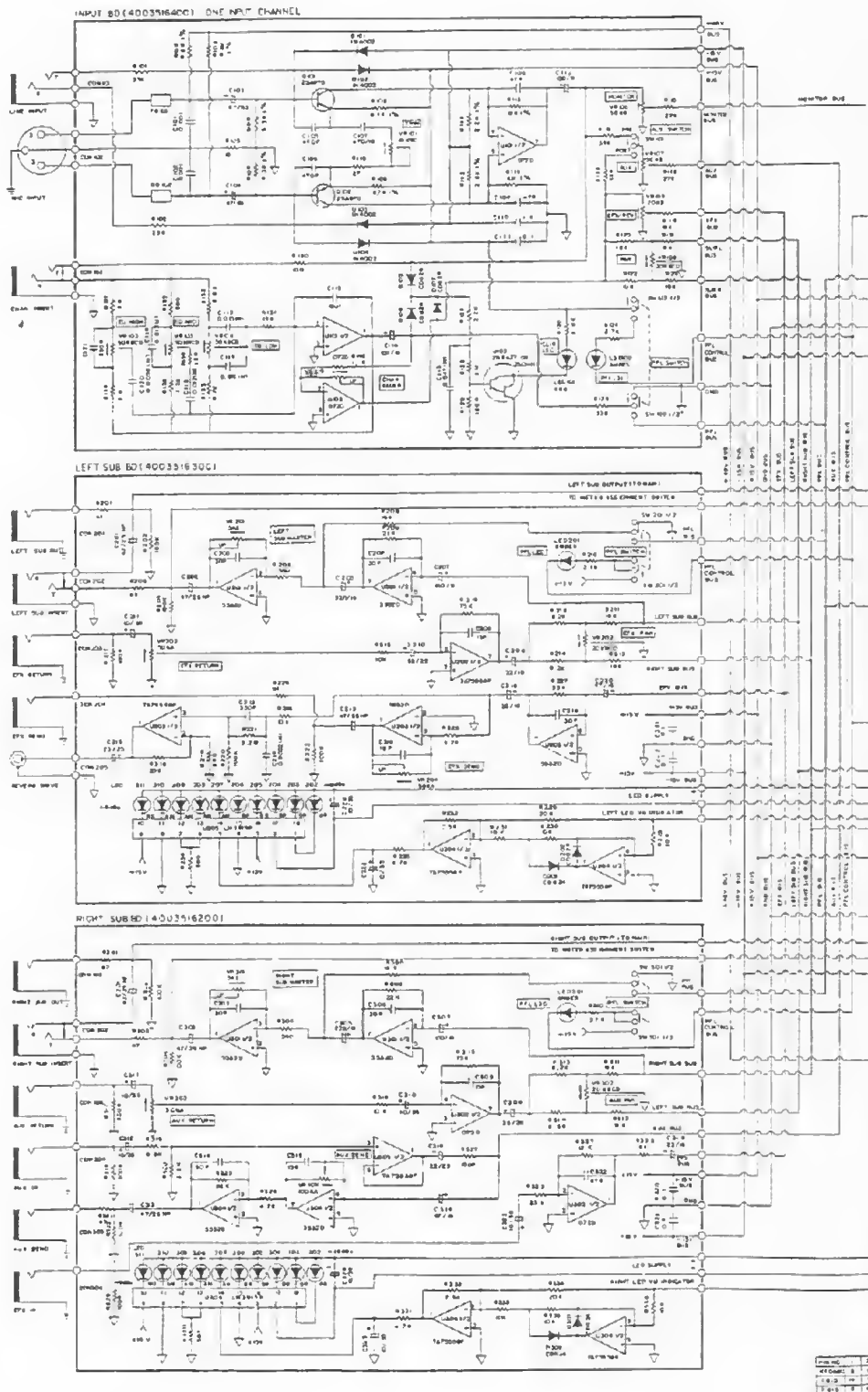
## SECTION 9.0

## 9.0 SCHEMATIC



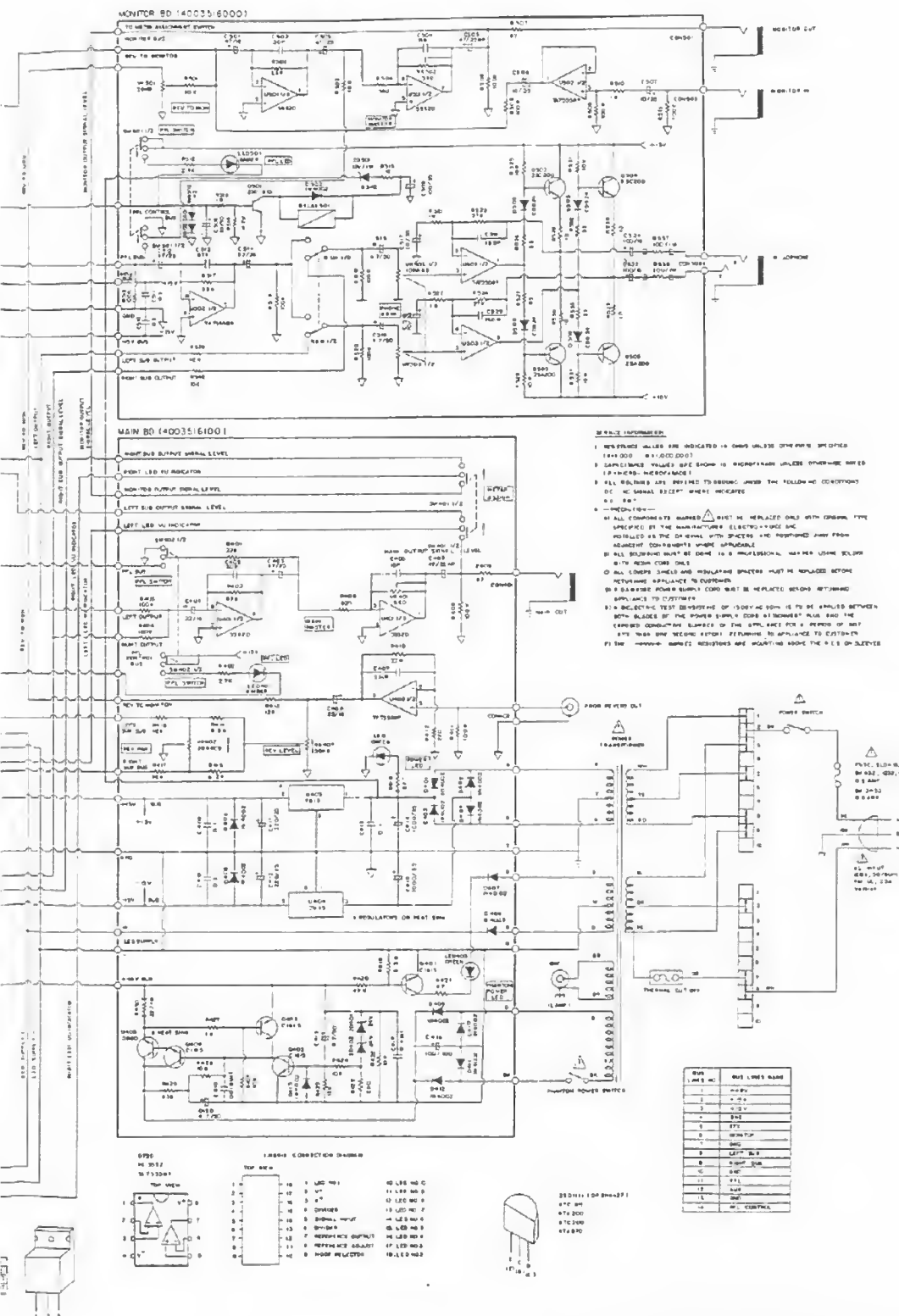
INPUT BOARD

6.0 SCHEMATIC



SECTION 7.0

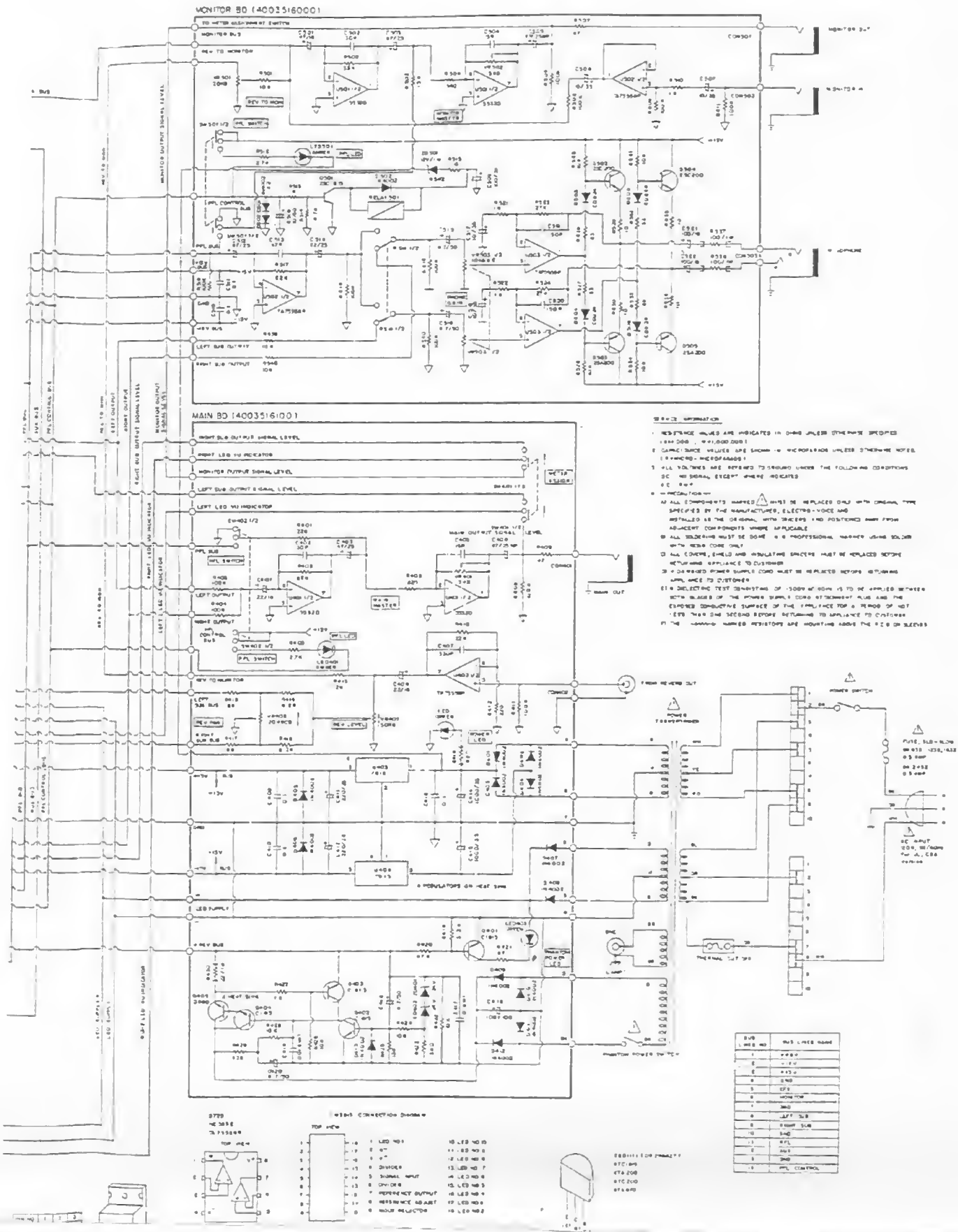
7.0 SCHEMATIC





# SECTION 7.0

## 7.0 SCHEMATIC



## 7.5 COMPONENT PARTS LISTING

## Main Assembly

Reference Designator	Ordering Number	Name and Description
N/A	A14-01-036182U	Plastic power pod, BK1242
N/A	A14-01-036185U	Plastic power pod, BK1642
N/A	A14-01-036186U	Plastic power pod, BK2442
N/A	A14-02-029115U	Cap, vinyl, BNC
N/A	A21-01-028398	Connector, XLR, female with latch
N/A	A21-01-028472	Connector, 1/4-inch phone, mono, grounded
N/A	A21-01-028641	Connector, 1/4-inch phone, stereo, grounded
N/A	A21-01-107505	Connector, 1/4-inch phone, stereo
N/A	A21-01-036190U	Connector, 1/4-inch phone, stereo, shorted, grounded
N/A	A21-02-122141	Connector, XLR, male
N/A	A21-02-036195U	Connector, IEC, AC power
N/A	A21-01-036194U	Connector, quad RCA phono, panel mount
N/A	A21-02-036198U	Connector, BNC, panel mount
N/A	A28-03-125230U	Washer, lock, BNC
N/A	A28-02-125229U	Nut, hex, BNC
N/A	A21-03-036197U	Lug, solder
N/A	A24-04-029102U	Knob, slide, med. gray with white stripe
N/A	A24-04-029103U	Knob, slide, lt. gray with black stripe
N/A	A24-04-029104	Knob, lt. blue cap, med. gray body
N/A	A24-04-029105	Knob, med. blue cap, med. gray body
N/A	A24-04-029106U	Knob, yellow cap, med. gray body
N/A	A24-04-036192U	Knob, lt. green cap, med. gray body
N/A	A24-04-029107	Knob, lt. gray cap, med. gray body
N/A	A24-04-036191U	Knob, push button, lt. gray
N/A	A29-01-037292U	Meter, VU, 2.5-inch
N/A	A42-01-037319U	Shipping carton, BK842
N/A	A42-01-037319U	Shipping carton, BK1242
N/A	A42-01-029120U	Shipping carton, BK1642
N/A	A42-01-037320U	Shipping carton, BK2442
N/A	A47-06-039098U	Potentiometer, 10 k $\Omega$ , audio taper, slide, 100 mm
N/A	A51-02-026775	Switch, power, rocker, 250 V
N/A	A51-02-029099U	Switch, slide
N/A	A51-02-036196U	Switch, line select
N/A	A51-04-036199U	Fuse, .25 A, 250 V, slo-blo, 5 $\times$ 20 mm
N/A	A51-04-036193U	Fuse, .4 A, 250 V, slo-blo, 3AG
N/A	A51-04-026779	Fuse holder, panel mount
N/A	A51-07-026796	Fuse cap, 3AG, 1/4 $\times$ 1 1/4-inch
N/A	A51-07-026866	Fuse cap, 5 $\times$ 20 mm
N/A	A56-08-029101U	Transformer, power
N/A	A60-06-124962	Power cord, IEC detachable
N/A	A60-14-029121U	Cable, insert patching

## Input Board Assembly (A27-01-037294U)

Reference Designator	Ordering Number	Name and Description
C101, C102	A15-02-037138I	Capacitor, 0.001 $\mu$ F, 50 V, 10%, ceramic disk
C103, C104	A15-01-124504	Capacitor, 22 $\mu$ F, 50 V, radial, electrolytic
C105, C107, C118	A15-02-100035	Capacitor, 470 pF, 500 V, 10%, ceramic disk
C106	A15-01-037014	Capacitor, 470 $\mu$ F, 16 V, radial, electrolytic
C108, C109	A15-02-028693	Capacitor, 0.1 $\mu$ F, 50 V, 10%, ceramic disk
C110, C111, C120, C123	A15-02-028578	Capacitor, 47 pF, 50 V, 10%, ceramic disk
C112, C121	A15-01-125228U	Capacitor, 22 $\mu$ F, 25 V, radial, electrolytic
C113	A15-06-028853	Capacitor, 0.0068 $\mu$ F, 50 V, 10%, film
C114	A15-02-027454	Capacitor, 68 pF, 50 V, 10%, ceramic disk
C115	A15-06-124692	Capacitor, 0.0027 $\mu$ F, 100 V, 5%, film
C116, C117	A15-06-028021	Capacitor, 0.033 $\mu$ F, 50 V, 10%, film
C119	A15-06-028007	Capacitor, 0.0012 $\mu$ F, 50 V, 10%, film
C122	A15-01-122935	Capacitor, 10 $\mu$ F, 35 V, radial, electrolytic
C124	A15-01-124341	Capacitor, 47 $\mu$ F, 25 V, radial, electrolytic

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Input Board Assembly (A27-01-037294U) cont.

Reference Designator	Ordering Number	Name and Description
C125	A15-06-027367	Capacitor, 0.047 $\mu$ F, 50 V, 5%, film
D101,D102,D103,D104,D105,D106,D107	A48-01-122601	Diode, signal, 1N4148/1N4448
D108	A39-01-026843	LED, red, round, 1.6 V, T-1
D109	A39-01-036189U	LED, amber, round, 1.6 V, T-1
Q101,Q102	A48-03-028829	Transistor, PNP, 2SA991/2SA970BL
Q103	A48-03-125224U	Transistor, NPN, darlington, MPSA13
R101,R102	A47-01-028828	Resistor, 15 $\Omega$ , 0.25 watt, 5%
R103,R104	A47-03-125225U	Resistor, 6.8 k $\Omega$ , 0.25 watt, 1%
R105,R106	A47-01-102113	Resistor, 30 k $\Omega$ , 0.25 watt, 5%
R107,R108	A47-03-124678	Resistor, 3.01 k $\Omega$ , 0.25 watt, 1%
R109,R110	A47-03-125227U	Resistor, 2.2 k $\Omega$ , 0.25 watt, 1%
R111	A47-01-102040	Resistor, 27 $\Omega$ , 0.25 watt, 5%
R112,R113	A47-03-125226U	Resistor, 4.7 k $\Omega$ , 0.25 watt, 1%
R114,R115	A47-03-109437	Resistor, 10.0 k $\Omega$ , 0.25 watt, 1%
R116,R129	A47-01-102110	Resistor, 22 k $\Omega$ , 0.25 watt, 5%
R117	A47-01-102054	Resistor, 100 $\Omega$ , 0.25 watt, 5%
R118,R119,R124,R126,R131,R132,R133, R134	A47-01-102102	Resistor, 10 k $\Omega$ , 0.25 watt, 5%
R120,R121	A47-01-102109	Resistor, 20 k $\Omega$ , 0.25 watt, 5%
R122,R123	A47-01-102098	Resistor, 6.8 k $\Omega$ , 0.25 watt, 5%
R125,R137	A47-01-102114	Resistor, 33 k $\Omega$ , 0.25 watt, 5%
R127,R130	A47-01-102094	Resistor, 4.7 k $\Omega$ , 0.25 watt, 5%
R128	A47-01-102096	Resistor, 5.6 k $\Omega$ , 0.25 watt, 5%
R135,R136	A47-01-102108	Resistor, 18 k $\Omega$ , 0.25 watt, 5%
R138	A47-01-102086	Resistor, 2.2 k $\Omega$ , 0.25 watt, 5%
R139	A47-01-108491	Resistor, 1 M $\Omega$ , 0.25 watt, 5%
R140	A47-01-109298	Resistor, 180 k $\Omega$ , 0.25 watt, 5%
R141	A47-01-102084	Resistor, 1.8 k $\Omega$ , 0.25 watt, 5%
R149	A47-01-102088	Resistor, 2.7 k $\Omega$ , 0.25 watt, 5%
U101,U102	A17-01-124688	IC, dual op-amp, TL072CP
VR101	A47-06-029097U	Potentiometer, 10 k $\Omega$ , reverse audio taper, 16 mm
VR102,VR103,VR105	A47-06-027344	Potentiometer, 50 k $\Omega$ , linear taper, 16 mm
VR104	A47-06-029093U	Potentiometer, dual, 100 k $\Omega$ , reverse audio taper, 16 mm
VR106,VR107,VR108	A47-06-029096U	Potentiometer, 10 k $\Omega$ , audio taper, 16 mm
VR109	A47-06-029095U	Potentiometer, 20 k $\Omega$ , linear taper, 16 mm
N/A	A51-02-029100U	Switch, push button, DPDT

Power Supply Board Assembly (A27-01-037298U)

Reference Designator	Ordering Number	Name and Description
C551	A15-06-027451	Capacitor, 0.1 $\mu$ F, 50V, 10%, film
C552,C554	A15-01-124506	Capacitor, 4.7 $\mu$ F, 50 V, radial, electrolytic
C553	A15-06-028019	Capacitor, 0.018 $\mu$ F, 100 V, 10%, film
C555	A15-01-029112U	Capacitor, 100 $\mu$ F, 100 V, radial, electrolytic
C556,C557	A15-02-028693	Capacitor, 0.1 $\mu$ F, 50 V, ceramic disk
C558,C559	A15-01-029111U	Capacitor, 220 $\mu$ F, 25 V, radial, electrolytic
C560,C561	A15-01-029110U	Capacitor, 1000 $\mu$ F, 35 V, radial, electrolytic
D551	A48-01-028581	Diode, zener, 47 V, 1N5261B
D553,D554,D555,D556,D557,D558,D559, D560,D561,D562,D563	A48-01-037276I	Diode, 200 V, 1N4002
Q551,Q552	A48-03-026624	Transistor, NPN, 2SC1815
Q554	A48-03-028586	Transistor, NPN, power, TIP29C
R550	A47-01-102110	Resistor, 22 k $\Omega$ , 0.25 watt, 5%
R551,R553,R555,R557	A47-01-102102	Resistor, 10 k $\Omega$ , 0.25 watt, 5%
R552	A47-01-102068	Resistor, 390 $\Omega$ , 0.25 watt, 5%
R554	A47-01-102106	Resistor, 15 k $\Omega$ , 0.25 watt, 5%
R556	A47-01-102078	Resistor, 1 k $\Omega$ , 0.25 watt, 5%
R558	A47-01-102114	Resistor, 33 k $\Omega$ , 0.25 watt, 5%
R559	A47-02-125215U	Resistor, 22 $\Omega$ , 1 watt, 5%
U551	A17-01-121660	IC, +15 V regulator, 1 A, 7815
U552	A17-01-121659	IC, -15 V regulator, 1.5 A, 7915

Sub Board Assembly (A27-01-037295U)

Reference Designator	Ordering Number	Name and Description
C201,C215,C217,C218,C219,C220,225	A15-01-026639	Capacitor, 100 $\mu$ F, 25 V, radial, electrolytic
C202,C204	A15-02-037136I	Capacitor, 33 pF, 50 V, 5%, ceramic disk
C203,C205	A15-02-028693	Capacitor, 0.1 $\mu$ F, 50 V, 10%, ceramic disk
C206,C207,C212	A15-01-124341	Capacitor, 47 $\mu$ F, 25 V, radial, electrolytic
C208,C224	A15-02-125223U	Capacitor, 22 pF, 50 V, ceramic disk
C209,C222,C223	A15-01-125228U	Capacitor, 22 $\mu$ F, 25 V, radial electrolytic
C210	A15-02-100307	Capacitor, 0.01 $\mu$ F, 100 V, ceramic disk
C211,C221	A15-02-037203I	Capacitor, 27 pF, 50 V, 5%, ceramic disk
C213	A15-01-122935	Capacitor, 10 $\mu$ F, 35 V, radial, electrolytic
C214,C216	A15-02-029032	Capacitor, 15 pF, 50 V, 5%, ceramic disk
D201	A39-01-036189U	LED, amber, round, 1.6 V, T-1
R201,R233	A47-01-102030	Resistor, 10 $\Omega$ , 0.25 watt, 5%
R202,R208,R209	A47-01-102108	Resistor, 18 k $\Omega$ , 0.25 watt, 5%
R203,R210,R211,R212,R226,R227,R236	A47-01-102102	Resistor, 10 k $\Omega$ , 0.25 watt, 5%
R204	A47-01-102109	Resistor, 20 k $\Omega$ , 0.25 watt, 5%
R205,R238	A47-01-102054	Resistor, 100 $\Omega$ , 0.25 watt, 5%
R206	A47-01-102106	Resistor, 15 k $\Omega$ , 0.25 watt, 5%
R207,R237	A47-01-102119	Resistor, 47 k $\Omega$ , 0.25 watt, 5%
R213	A47-01-102093	Resistor, 4.3 k $\Omega$ , 0.25 watt, 5%
R214,R219,R220,R224	A47-03-109437	Resistor, 10.0 k $\Omega$ , 0.25 watt, 1%
R215	A47-03-124617	Resistor, 19.1 k $\Omega$ , 0.25 watt, 1%
R216,R222	A47-01-102051	Resistor, 75 $\Omega$ , 0.25 watt, 5%
R217,R225	A47-03-123009	Resistor, 21.0 k $\Omega$ , 0.25 watt, 1%
R218,R223	A47-01-028828	Resistor, 15 $\Omega$ , 0.25 watt, 5%
R221	A47-03-109434	Resistor, 20.0 k $\Omega$ , 0.25 watt, 1%
R228	A47-01-102086	Resistor, 2.2 k $\Omega$ , 0.25 watt, 5%
R229	A47-01-102082	Resistor, 1.5 k $\Omega$ , 0.25 watt, 5%
R230	A47-01-102104	Resistor, 12 k $\Omega$ , 0.25 watt, 5%
R231,R235	A47-01-102114	Resistor, 33 k $\Omega$ , 0.25 watt, 5%
R232	A47-01-102088	Resistor, 2.7 k $\Omega$ , 0.25 watt, 5%
R234	A47-01-102120	Resistor, 51 k $\Omega$ , 0.25 watt, 5%
R239,R240	A47-01-102110	Resistor, 22 k $\Omega$ , 0.25 watt, 5%
U201,U202	A17-01-124688	IC, dual op-amp, TL072CP
U203,U204	A17-01-122832	IC, dual op-amp, 5532A
VR201,VR202,VR203	A47-06-029096U	Potentiometer, 10 k $\Omega$ , audio taper, 16 mm
VR204	A47-06-029095U	Potentiometer, 20 k $\Omega$ , linear taper, 16 mm
N/A	A51-02-029100U	Switch, push button, DPDT

Display Board Assembly (A27-01-037299U)

Reference Designator	Ordering Number	Name and Description
C601,C603	A15-01-122935	Capacitor, 10 $\mu$ F, 35 V, radial, electrolytic
C602,C604	A15-06-027367	Capacitor, 0.047 $\mu$ F, 50 V, 5%, film
D603,D604,D606,D607	A48-01-125214U	Diode, signal, 1N60
D605,D608	A48-01-122601	Diode, signal, 1N4148/1N4448
LD601,LD602,LD603,LD604,LD605,LD606	A39-01-036181U	LED, yellow, hi-intensity, 5 mm, RT5-437AT-T
LD607	A39-01-036178U	LED, green, 5 mm, RT5-537YG
LD608	A39-01-036177U	LED, red, 5 mm, RT5-237HR
LD609,LD610	A39-01-036179U	LED, red, 3 mm, RT-3517PR
LD611	A39-01-036180U	LED, yellow, 5 mm, RT5-437AD
Q601,Q602	A48-03-125224U	Transistor, NPN, darlington, MPSA13
R601,R608	A47-01-102070	Resistor, 470 $\Omega$ , 0.25 watt, 5%
R602,R603,R609,R610	A47-01-102080	Resistor, 1.2 k $\Omega$ , 0.25 watt, 5%
R604,R611	A47-01-102094	Resistor, 4.7 k $\Omega$ , 0.25 watt, 5%
R605,R612	A47-01-108491	Resistor, 1 M $\Omega$ , 0.25 watt, 5%
R606,R613	A47-01-109298	Resistor, 180 k $\Omega$ , 0.25 watt, 5%
R607,R614	A47-01-102084	Resistor, 1.8 k $\Omega$ , 0.25 watt, 5%

Main Board Assembly (A27-01-037296U)

Reference Designator	Ordering Number	Name and Description
C301	A15-01-124341	Capacitor, 47 $\mu$ F, 25 V, radial, electrolytic
C302	A15-02-028578	Capacitor, 47 pF, 50 V, 10%, ceramic disk
C303,307	A15-01-125228U	Capacitor, 22 $\mu$ F, 25 V, radial, electrolytic
C304,C308	A15-02-028693	Capacitor, 0.1 $\mu$ F, 50 V, ceramic, disk
C305,C316,C317,C318,C319	A15-01-122935	Capacitor, 10 $\mu$ F, 35 V, radial, electrolytic
C306	A15-02-125222U	Capacitor, 30 pF, 50 V, ceramic disk
C309,C310	A15-02-029032	Capacitor, 15 pF, 50 V, ceramic disk
C311,C313,C314,C315	A15-01-026639	Capacitor, 100 $\mu$ F, 25 V, radial, electrolytic
C312	A15-02-100307	Capacitor, 0.01 $\mu$ F, 100 V, ceramic disk
D301	A39-01-036189U	LED, amber, round, 1.6 V, T-1
R301,R302,R306,R319,R320,R321,R325, R328	A47-01-102102	Resistor, 10 k $\Omega$ , 0.25 watt, 5%
R303,R324,R327	A47-01-102098	Resistor, 6.8 k $\Omega$ , 0.25 watt, 5%
R304	A47-01-102114	Resistor, 33 k $\Omega$ , 0.25 watt, 5%
R305	A47-01-102093	Resistor, 4.3 k $\Omega$ , 0.25 watt, 5%
R307,R308,R313,R317	A47-03-109437	Resistor, 10.0 k $\Omega$ , 0.25 watt, 1%
R309	A47-03-124617	Resistor, 19.1 k $\Omega$ , 0.25 watt, 1%
R310,R315	A47-01-102051	Resistor, 75 $\Omega$ , 0.25 watt, 5%
R311,R316	A47-01-028828	Resistor, 15 $\Omega$ , 0.25 watt, 5%
R312,R318	A47-03-123009	Resistor, 21.0 k $\Omega$ , 0.25 watt, 1%
R314	A47-03-109434	Resistor, 20.0 k $\Omega$ , 0.25 watt, 1%
R322	A47-01-102088	Resistor, 2.7 k $\Omega$ , 0.25 watt, 5%
R323,R326,R337,R338,R339	A47-01-102110	Resistor, 10 k $\Omega$ , 0.25 watt, 5%
U301	A17-01-124688	IC, dual op-amp, TL072CP
U302	A17-01-122832	IC, dual op-amp, 5532A
U303	A17-01-027463	IC, dual op-amp, 4558
VR301	A47-06-029096U	Potentiometer, 10 k $\Omega$ , audio taper, 16 mm
N/A	A51-02-029100U	Switch, push button, DPDT

Monitor Board Assembly (A27-01-037297U)

Reference Designator	Ordering Number	Name and Description
C401,C410,C416,C417,C418,C419,C426, C427,C429	A15-01-026639	Capacitor, 100 $\mu$ F, 25 V, radial, electrolytic
C402	A15-02-037136I	Capacitor, 33 pF, 50 V, ceramic disk
C403,C405	A15-02-028693	Capacitor, 0.1 $\mu$ F, 50 V, ceramic disk
C404,C408	A15-02-037203I	Capacitor, 27 pF, 50 V, ceramic disk
C406,C407,C409	A15-01-125228U	Capacitor, 22 $\mu$ F, 25 V, radial, electrolytic
C411	A15-02-028578	Capacitor, 47 pF, 50 V, ceramic disk
C412,C420,C423	A15-01-122935	Capacitor, 10 $\mu$ F, 35 V, radial, electrolytic
C413	A15-02-100307	Capacitor, 0.01 $\mu$ F, 100 V, ceramic disk
C414,C415	A15-02-029032	Capacitor, 15 pF, 50 V, ceramic disk
C421,C424	A15-02-027455	Capacitor, 100 pF, 50 V, ceramic disk
C428	A15-01-124502	Capacitor, 10 $\mu$ F, 50 V, radial, electrolytic
D401	A39-01-036189U	LED, amber, round, 1.6 V, T-1
D402,D403,D404,D405	A48-01-122601	Diode, signal, 1N4148/1N4448
D406,D407,D409	A48-01-037276I	Diode, 200 V, 1N4002
D408	A48-01-125217U	Diode, zener, 12 V, 1 watt, 1N4742B
K1,K2	A45-01-036187U	Relay, DPDT, 12 V
Q401,Q403	A48-03-125218U	Transistor, NPN, 2SC2274
Q402,Q404	A48-03-125219U	Transistor, PNP, 25A984
Q405	A48-03-026624	Transistor, NPN, 2SC1815
R401,R410,R434,R435,R442,R443	A47-01-102030	Resistor, 10 $\Omega$ , 0.25 watt, 5%
R402	A47-01-102124	Resistor, 75 k $\Omega$ , 0.25 watt, 5%
R403,R404,R408,R425,R426,R427,R428, R432,R433,,R436,R440,R441	A47-01-102102	Resistor, 10 k $\Omega$ , 0.25 watt, 5%
R405,R406,R411	A47-01-102114	Resistor, 33 k $\Omega$ , 0.25 watt, 5%
R407	A47-01-102093	Resistor, 4.3 k $\Omega$ , 0.25 watt, 5%
R409	A47-01-102088	Resistor, 2.7 k $\Omega$ , 0.25 watt, 5%
R412,R450	A47-01-102110	Resistor, 22 k $\Omega$ , 0.25 watt, 5%

Monitor Board Assembly (A27-01-037297U) cont.

Reference Designator	Ordering Number	Name and Description
R413,R414,R415,R422	A47-03-109437	Resistor, 10.0 k $\Omega$ , 0.25 watt, 1%
R416	A47-03-124617	Resistor, 19.1 k $\Omega$ , 0.25 watt, 1%
R417,R424	A47-01-102051	Resistor, 75 $\Omega$ , 0.25 watt, 5%
R418,R423	A47-03-123009	Resistor, 21.0 k $\Omega$ , 0.25 watt, 1%
R419,R421	A47-01-028828	Resistor, 15 $\Omega$ , 0.25 watt, 5%
R420	A47-03-109434	Resistor, 20.0 k $\Omega$ , 0.25 watt, 1%
R429,R437	A47-01-102120	Resistor, 51 k $\Omega$ , 0.25 watt, 5%
R430,R431,R438,R439	A47-01-102042	Resistor, 33 $\Omega$ , 0.25 watt, 5%
R444,R445	A47-02-125221U	Resistor, 100 $\Omega$ , 1 watt, 5%
R446	A47-01-102086	Resistor, 2.2 k $\Omega$ , 0.25 watt, 5%
R447	A47-02-125220U	Resistor, 330 $\Omega$ , 1 watt, 5%
R448	A47-01-102078	Resistor, 1 k $\Omega$ , 0.25 watt, 5%
R449	A47-01-102094	Resistor, 4.7 k $\Omega$ , 0.25 watt, 5%
U401,U402	A17-01-124688	IC, dual op-amp, TL072CP
U403	A17-01-122832	IC, dual op-amp, 5532A
U404	A17-01-027463	IC, dual op-amp, 4558
VR401	A47-06-029096U	Potentiometer, 10 k $\Omega$ , audio taper, 16 mm
VR402	A47-06-125216U	Potentiometer, dual, 10 k $\Omega$ , audio taper, 16 mm
N/A	A51-02-029100U	Switch, push button, DPDT

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